

REMARKS

Status of Claims

Claims 1, 2 and 6 are rejected and claims 4 and 5 are withdrawn, pursuant to a Restriction Requirement dated March 28, 2006.

Claim 1 is amended. Support for the amendment can be found at least at Figs. 1 and 3 of the present specification. Claim 6 is canceled in view of the amendment of claim 1.

No new matter is added.

Entry of the Amendment is respectfully requested.

Response to Rejection Under 35 U.S.C. § 103

The Examiner has maintained the rejection of claims 1, 2 and 6 under 35 U.S.C. §103(a) as allegedly being unpatentable over Sawada et al. (U.S. Patent No. 5,404,032) in view of Kuroda et al. (U.S. Patent No. 5,831,296) (hereinafter “Sawada” and “Kuroda,” respectively), from the final Office Action dated October 15, 2007.

Applicants respectfully traverse the above §103 rejection.

Amended claim 1 recites a compound semiconductor epitaxial substrate for use in a strain channel high electron mobility field effect transistor, comprising an InGaAs layer as a strain channel layer and an AlGaAs layer containing n-type impurities as an electron supplying layer. The InGaAs layer has an electron mobility at room temperature of $8300 \text{ cm}^2/\text{V}\cdot\text{s}$ or more. Undoped GaAs layers having a thickness of 4 nm or more each are laminated respectively in contact with a top surface and a bottom surface of said strain channel layer. Additionally, the undoped GaAs layer is further in contact with an undoped AlGaAs layer, and the AlGaAs layer containing n-type impurities is in contact with the above undoped AlGaAs layer.

Therefore, the epitaxial substrate of the presently claimed invention has the following sequential layers:

(i) a GaAs single crystal substrate; (ii) a first set of alternating layers of undoped GaAs and AlGaAs, respectively; (iii) an n-doped AlGaAs electron supplying layer; (iv) a second set of alternating layers of undoped GaAs and AlGaAs, respectively; (v) an undoped InGaAs channel layer; (vi) a third set of alternating layers of undoped GaAs and AlGaAs, respectively; (vii) a second n-doped AlGaAs electron supplying layer; and (viii) a final set of alternating layers of undoped GaAs and AlGaAs.

In view of the above, the n-doped AlGaAs is in contact with undoped AlGaAs.

In contrast, Fig. 4 of Sawada, which the Examiner relies upon in his rejection, has an epitaxial structure having the following sequential layers:

(i) a GaAs substrate; (ii) an undoped GaAs buffer layer; (iii) an InGaAs layer; (iv) an n-doped GaAs layer; (v) an n-doped AlGaAs layer; and (vi) an n-doped GaAs capping layer.

Therefore, the n-AlGaAs electron supplying layer is sandwiched between two n-GaAs layers. Furthermore, in Figs. 2 and 4-9, all the epitaxial structures depicted therein have the n-AlGaAs layer in contact with, or sandwiched between n-GaAs layers, and never in contact with an undoped GaAs layer or an undoped AlGaAs layer.

Turning to Kuroda, the epitaxial structure shown therein has the following sequential layers:

(i) semi-insulating GaAs crystal substrate; (ii) an undoped GaAs layer; (iii) an intermediate layer, which may be undoped InGaAs, undoped GaAsSb, two successive layers of

undoped InGaAs and undoped GaAsSb, two successive layers of undoped InGaAs and undoped GaAs, or two successive layers of undoped GaAsSb and undoped GaAs; and (iv) an undoped AlGaAs layer.

In Kuroda, even though the undoped AlGaAs layer may be in contact with an undoped GaAs layer, there is no n-doped AlGaAs disclosed in Kuroda. Therefore, Kuroda does not cure the deficiency of Sawada with respect to the n-doped AlGaAs not being in contact with an undoped GaAs layer or an undoped AlGaAs layer.

In view of the above, Applicants respectfully submit that a person of ordinary skill in the art would not be motivated to combine Sawada and Kuroda to arrive at the presently claimed invention with a reasonable expectation of success. Claim 1 is therefore distinguishable over Sawada in view of Kuroda. Claim 2 is also distinguishable over Sawada in view of Kuroda, at least by virtue of its dependence from claim 1.

Therefore, Applicants respectfully request reconsideration and withdrawal of the §103 rejection of the presently claimed invention.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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